



EAB Investment Group, LLC
White Paper

Defensive Equity as a fixed income replacement

Abstract:

Much attention has been paid of late to the building of diversified portfolios to smooth out performance through the reduction of meaningful draw downs. This analysis looks at asset allocation and the importance of understanding the correlations of portfolio assets in arriving at more effective diversification for investors. Particular attention is paid to the relationship of fixed income as a diversifier in equity bear markets and the circumstances where its diversification value may erode. Correlation volatility as expressed by the range of correlation is presented as an indicator to predict portfolio performance under stress. While some investment practitioners may also look at Beta and Covariance as important portfolio tools, this paper focuses on the fundamental factor of correlation as it is the driving force of directional protection. The analysis shows the benefit of incorporating consistent negative correlation exposure into the equity component of portfolios as an alternative to using fixed income to improve diversification during stress markets. This approach appears to be a more consistent diversifier than fixed income. Specific attention is paid to the credit sector's tendency to fluctuate in correlation to equities as well. Equity volatility under stress can be extremely disruptive. This analysis considers the value of systematic dedicated and stable negative correlation hedging within the equity sleeve of allocation in contrast to solely relying on the less stable negative correlation of the fixed income portion of the fixed income allocation. Suggestions for defensive equity allocations within a diversified portfolio are considered.

Summary of Conclusions:

1. Asset correlations are critical to the success of asset allocation performance.
2. Correlations are much less stable and reliable than commonly perceived
3. Fixed Income, traditionally a solid diversifier is vulnerable due to the low interest rate environment and may not offer much diversification benefit in a rising rate environment.
4. Equity put strategies provide consistent negative correlation, particularly in stress events.
5. Investors' significant increase in lower quality fixed income potentially leaves them more vulnerable from a correlation perspective to equity moves.
6. Synthetic strategies, such as a defensive equity approach, combining equity exposure and put protection provide consistent portfolio diversification and opportunity for return.
7. Blending defensive equity strategies within portfolios would improve diversification and longer term risk and reward relationships.

Asset Allocation and Portfolio Diversification:

Will expected portfolio returns look like the past?

For the past 65 years advisors have been turning to Professor Markowitz' Modern Portfolio Theory to reduce risk and improve the quality of investor portfolio returns. The important takeaway for investors is that blending the right assets in the optimal way can improve the risk and return of a blended portfolio over less diversified portfolios. Originally known as the theory of portfolio choice, the approach takes into account the forecast returns, volatility, and correlations of assets to arrive at optimal portfolios. Less than 30 years ago work derived from Professor William Sharpe's Capital Asset Pricing Model postulated that the return of an asset should be related to its risk. Expression of market risk often combines volatility of returns, forecasted returns, and correlation history to determine the best mix of assets. In order to manage the overall risk of disappointing their clients, advisors and managers have focused on keeping absolute and relative volatility low to improve the relationship between return and risk. Given the SEC disclaimer that past returns (and I extend it to correlations) are not indicative of future performance in making investment decisions, it is no surprise that actual experienced portfolio returns don't resemble the smooth forecasts provided to clients. Obviously, it is difficult to predict returns on individual stocks or the market in general. Another major issue is human behavior. Investors tend to panic sell at market bottoms and panic buy at market tops. This might not be the case if investors had faith in their diversification methodology and its soundness.

For investors it is asset class correlations that matter:

Volatility is the speed but correlations are the road map.

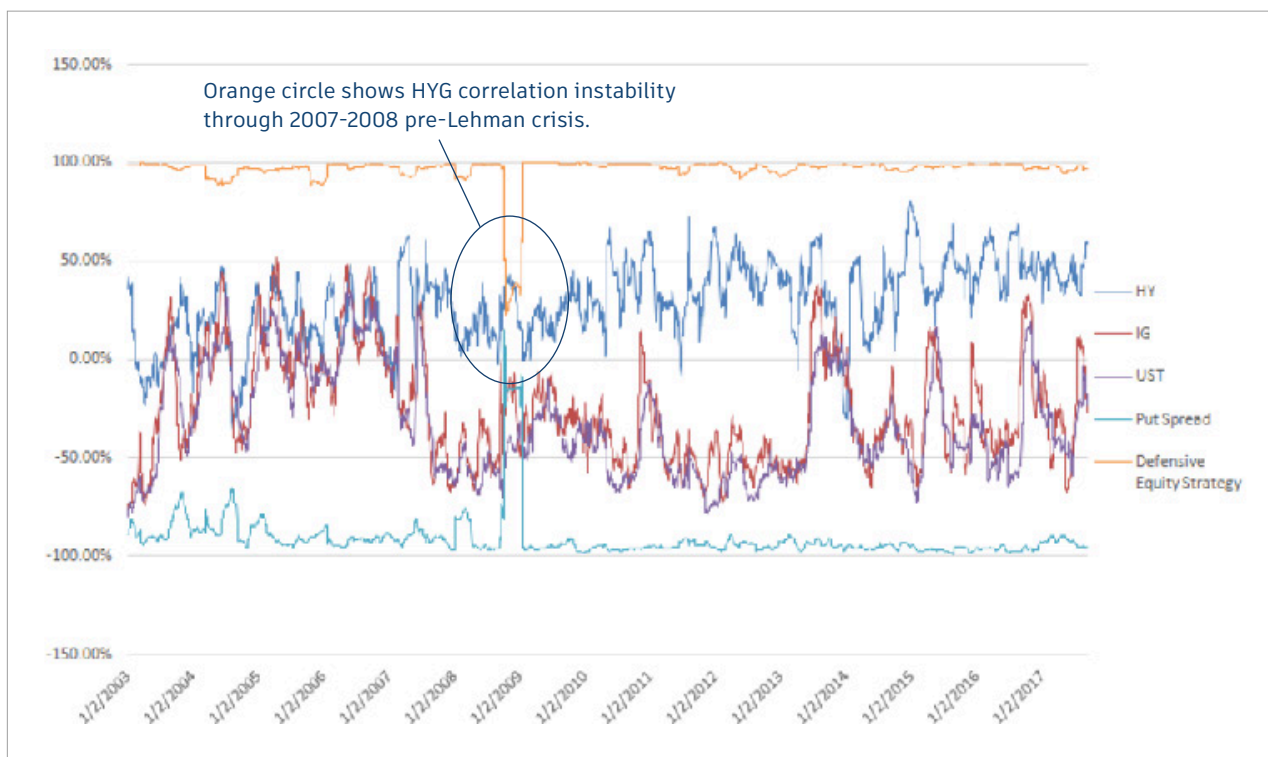
There has been much focus by advisors on managing overall portfolio volatility for their clients to eliminate the bumpiness of the performance ride. The thought that throttling down volatility alone may limit losses is inadequate and may be misleading to investors. A more important factor in asset allocation may be understanding both the stability and consistency of asset correlations in portfolios. This is particularly true during stress events. While some investment practitioners may also look at Beta and Covariance as important portfolio tools, this paper focuses on the fundamental factor of correlation as it is the driving force of directional protection. To reduce the risk of major drawdown, correlation is more important than forecasting the volatility of the markets or the asset classes perfectly. If volatility is incorrectly forecasted but correlations remain stable there should be an offsetting asset that diversifies the volatility effectively. In essence volatility is the speed of the car on a trip but the asset correlations are the road map that guides the driver. If correlations (or the relationships between asset classes or funds) do not remain stable, a portfolio we think is diversified may actually perform very differently than projected. This is the dilemma of diversification under stress. This effect has been noted by many in the asset allocation world and has led to an almost uniform rejection of the static 60/40 rule for asset allocation. *Investor portfolios tend to correlate much more than we expect under stress and that can cost portfolios tremendous value over time.* So while Modern Portfolio Theory and efficient portfolios are valuable planning tools, they rely significantly on forecasts and the assumption of the stability of correlations. *If the timing of returns is important to an investor (near retirement or later in life expectancy) or if significant risk is taken in a part of the portfolio (such as equity or lower quality credit funds) it needs to be hedged with less risky assets. We believe looking for consistently low or negative correlation assets can prove to be very valuable, particularly in stress markets.* What we will look at in this analysis is the stability and range of major asset correlations to the S&P 500 with a focus on fixed income and credit sectors. Many investors have been using this approach as a primary source of income and diversification against their equity holdings. If an asset or asset class has a wide range of correlation potential, it by definition, provides a wider range of hedged outcomes versus a negative equity market. If an asset has a tighter range of correlation potential, the hedged outcomes should be more predictable.

Fixed Income Sectors correlations versus the S&P:

A picture is worth a thousand words

Fixed income has historically served two purposes in portfolios over the years. 1- Fixed income provides income to live off without having to sell principal and 2- Fixed income historically also provides a hedge that performs defensively when the economy or equities, in general, struggle. But over the past decade, with interest rates being lowered to zero or near zero, the fixed income class has grown in allocation in portfolios. But more importantly, investors have increased their allocations to corporate credit and non-investment grade credit as interest rates have dropped in order to maximize the income in their portfolios. This has created both principal gains (as interest rates drop) and solid income for investors, but comes at a cost of lost diversification. As seen in the chart below not all fixed income defends equally against S&P returns and the range of correlation variability is actually quite high.

Chart 1. Long Term Inter-Asset trailing 3 month (60 trading days) Correlations to S&P 500 since 2003



Source EAB Investment Group, Yahoo Finance

Contrary to popular belief and the assumptions of asset allocation models, the chart above illustrates that correlations are not particularly stable. Interestingly, the put strategy and the synthetic combination of the puts and the equity index are very stable until the Lehman crisis when the put strategy provides a reduction in correlation. In other words, it acts as protection to the equity portion of the portfolio. This diversification value stands in contrast to the other asset classes where correlations in some cases rose dramatically. Most notably (see orange circle), high yield moved from near zero levels in the weeks prior to the Lehman crisis to well over 40% trailing 3 month correlations in the months after. While, it's not the purpose of this document to forecast crisis, *it would seem to us that the holding of a fixed income asset that has such a wide potential for correlation instability should be combined with a more diversified stable hedge.*

We theorize that correlation and the stability of correlation provides a better forecast of what could happen to a portfolio than a simple average or estimate of correlation. Looking at the data back to 2003, one can clearly see that investment corporate credit (the red line) and high yield (the dark blue line) specifically shows a very wide range of volatility, even turning significantly positive to equities periodically through history. High Yield can actually possess a positive correlation to equity and often does under times of stress. While average correlations could justify a significant allocation to high yield, it must be recognized that relying on the averages when stress correlations can have such a large effect could have precarious impacts should equities struggle.

Table 1. Volatility of asset correlations to the S&P 500 gives a clue to diversification stability

STANDARD DEVIATION OF TRAILING 3 MONTH CORRELATION TO S&P 500						
PERIOD	HIGH YIELD	INV GRADE	EM EQUITY	10 YR UST	2/7% OTM PUT SPREAD	DEFENSIVE EQUITY STRATEGY
Total S.D.	20%	28%	17%	27%	12%	9%
Last 5 Years S.D.	18%	25%	18%	22%	2%	1%
Last 10 Years S.D.	17%	22%	17%	20%	14%	10%
Maximum Correlation	81%	52%	77%	37%	15%	100%
Minimum Correlation	-36%	-76%	-5%	-80%	-99%	23%

Source EAB Investment Group, Yahoo Finance

Another way to look at correlations is to calculate the actual range of the correlations versus their mean as an indicator of diversification stability. From table 1, one can see that fixed income correlations have a relatively high range of correlation to equity. The US 10 year bond correlation, surprisingly led in volatility of correlation but the investment and high yield credit sectors also showed a much wider range of diversification effectiveness than perceived by practitioners. As can be clearly seen in the table, the S&P put strategy and the combined synthetic strategy show a much tighter range of correlation with the put strategy actually getting less volatile over the past 5 year period.

The benefits of the disciplined continuous put buying create a level of negative correlation and diversification stability that is difficult to find in fixed income. For investors and advisors where the sequence of returns is critical and there is concern about the potential for powerful bear equity markets, we would consider careful attention to portfolio stress correlation potential. Clearly any multi asset class funds or risk parity based strategies that assume correlation stability are also at risk of negative surprise as a result of correlation instability. *While the concept can be applied to multiple asset classes, our sense is that the fixed income class should be a primary focus because of the extreme Central Bank stimulus provided and the potential that this stimulus may, albeit slowly, be withdrawn in the future.*

Fixed Income and why coupon diversifies equity returns:

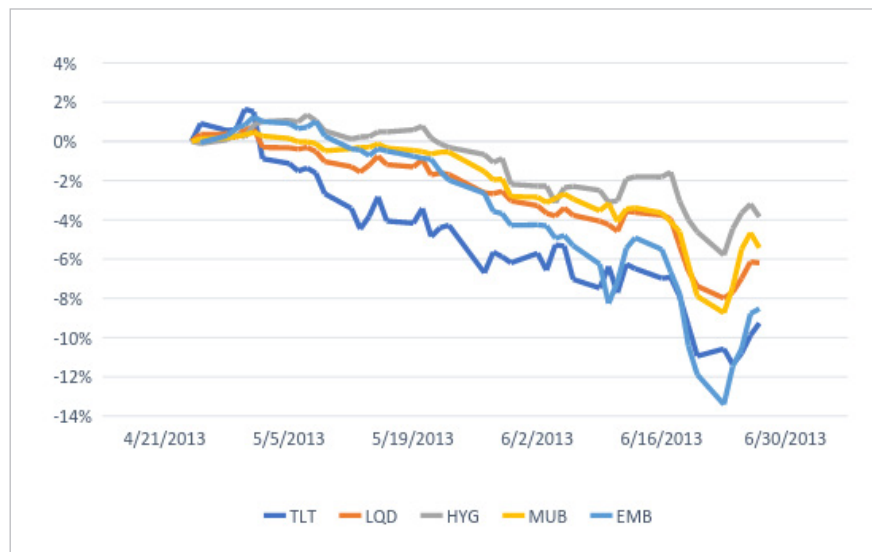
If one looks at the data prior to the recent Central Bank quantitative easing period there was a distinct benefit to holding a mix of stocks and bonds. Much of that benefit derived from the fact that medium term US government bonds provided an income flow that moderated the impact of equity downdrafts in all but the most severe equity bear markets. In the 1980- 2000 period with the 10 year US government bond rates averaging approximately 6%, the coupon yield of the bonds alone in a 40% bond allocation portfolio could offset 2.4% of any equity market loss (40% x 6% annual coupon). But since the “tech wreck” (2001) short interest rates have been dropped to near zero by the Fed and long rates have been cut in half by the significant demand for government bonds that quantitative easing has fostered. In today’s marketplace, the same allocation would only provide an approximate .9% offset (assume a 2.25% annual coupon x 40%). In addition, in today’s post QE lower interest rate world, the outcome would need to take into account another factor connected to the relationship of interest rates to bond value called duration. As rates go lower, the average maturity and duration of a bond get longer as a greater proportion of its cash flows come at principal maturity. While the reduction in coupon is an obvious negative for diversification, another often overlooked risk is the impact of lower rates on bond volatility because of the impact on average life or duration of the bond or portfolio. The duration measures the sensitivity of the bond or portfolio to changes in interest rates. We will focus on interest rate hikes for this analysis because rates seem to have limited downside. What follows in Table 2 are hypothetical examples of what returns could look like at various levels of interest rate hikes to bonds and 60/40 portfolios.

Table 2. The duration impact of low rates makes even government bonds more volatile.

DIVERSIFICATION BENEFIT OF 10Y US TREASURY FOR 60/40 PORTFOLIO FOR 1% RATE HIKE				
Period	JAN-03	JAN-17	AUG-12	AUG-17
Duration	7.96	7.70	9.15	8.88
Coupon	4.00%	4.58%	1.58%	2.25%
Equity Market Return				
-5%	-4.58%	-4.25%	-6.03%	-5.65%
-10%	-7.58%	-7.6%	-9.03%	-8.65%
-15%	-10.58%	-10.25%	-12.03%	-11.65%
-20%	-13.58%	-13.25%	-15.03%	-14.65%

Source EAB Investment Group, Yahoo Finance

Chart 2. Taper Tantrum asset performance



Source EAB Investment Group, Yahoo Finance

The Bloomberg chart above shows the performance of well known bond index ETFs (even including the Municipal bond ETF, MUB and Emerging Markets bonds EMB). The extreme negative performance of fixed income occurred during these two months in 2013 on the threat of tapering as the FED had not set in stone any commitment. The -6.38% loss for that period in corporate bonds (LQD) and -9.81% for TLT led to negative annual returns for these fixed income categories for the year. While this is an anecdotal example, we think a true tapering process could potentially hurt holders of long bonds and credit strategies to a greater degree over a longer period of time. If an eventual equity downdraft were to occur, as they have historically later into a Fed hiking regime, credit oriented portfolios could suffer twice as both fixed income and equities suffer. This relationship is clearly seen in the correlation data around the May 2013 correction. We think this example, while only one single observation, is intuitive and instructive for current investors concerned about diversification and drawdown limitation.

Portfolio Defense, a timely allocation for equity and fixed income credit risk:

For the purposes of this analysis we will use a systematic out of the money 2 month expiry put spread strategy as a defensive equity approach. When one analyzes the correlation of the two month S&P 500 2%-7% out of the money (OTM) put spread performance correlation against the S&P, its steady negative correlation and its reduction of correlation to the S&P during stressed periods becomes obvious. Of course this makes sense to the average investor as the puts are buying the rights to sell the S&P 500 itself at a designated price that could be higher than the market price at that time, generating a profit.

Should the S&P not drop below that price, however, the cost of the puts would be a type of insurance premium that is lost. The combined equity index and put simulation shown above demonstrates that this type of put rebalancing and option strike price range offers an efficient manner in which to defend equity exposure. The strategy still participates to some extent in equity returns should the markets be positively skewed. In major bear market moves, the defensive equity strategy could generally perform better than the lower rated credit funds which become unstable in their correlations to equity as shown in the chart above. When combined with an equity index the puts provide a less correlated alternative to equities under stress than low quality credit approaches do, thus more predictability. While this defensive equity approach would pay a very low dividend annually to help fund the cost of the put strategy, its appeal is its consistent negative correlation of returns under extreme stressed equity markets. As one examines the return stream of the puts approach, the stability of its correlation is evident as is its value under stress. By combining the underlying index with the put approach, which can often be a cost (similar to insurance) a new return stream is generated that has some of the characteristics of equity and some of the defensive characteristics an investor wants in stress markets. *This alternative, in our view, warrants an allocation of investor portfolios to hedge both lower quality credit risk and equity risk.*

While we have presented some of the weaknesses of Modern Portfolio Theory optimizations with regards to correlation estimates, if one were to look at the post QE environment to construct an efficient portfolio, the Defensive Equity approaches would still garner allocations. Using traditional techniques, our models consider a range of 15-17% to be a reasonable allocation for domestic defensive equity portfolios and 2-3% for defensive emerging equity. For more risk adverse investors, however, an allocation of up to 5% defensive emerging markets equity could more effectively complement a domestic defensive equity allocation in times of stress. It's important to note that the last several years have been a negative period for diversification and low volatility strategies in general as the markets have been very positive during this period. *If one were to forecast much less effective fixed income correlation diversification or higher forecast volatility, the allocations to defensive equity funds would likely increase significantly.* As a result, we feel confident in our base line consideration for investors who are particularly concerned about volatility spikes, or extreme equity market events, potentially higher allocations to defensive equity may be justified. For the aggressive investor we would recommend the allocation would mostly come from the equity allocation and for the conservative investor a greater proportion would come from the credit portion of the portfolio. One special case to evaluate is income only investors that use no equity at the moment. For these investors where the correlation to equities may be hidden in increased credit exposure, the lower correlation defensive equity could be an appropriate way to improve diversification. The combination of the domestic and emerging markets equity defensive strategies, while statistically warranted seems even more appropriate taking into account the growing impact global events can have on U.S. investors. As the correlations of these two strategies do not mirror each other identically, there can be an additional source of alpha for more aggressive and equity diversified portfolios. These might be impacted by elements like strength of the dollar or geopolitical events that could hurt international or emerging markets equities, but not significantly move U.S. domestic equities. In this case we think a 70/30% split between a Domestic defensive equity and emerging markets defensive equity model may provide the most robust mix against both domestic and international equity stress.

About the Study:

While the study is based on data and its' analysis, the approach taken and communicated is not meant to be a quantitative treatise. Certainly, the math upon which the study rests can be presented but is not necessary for the conclusions drawn. The daily data in this study goes back to January of 2003 which we believe is a significant enough time period for the conclusions drawn. The team also evaluated various trailing correlation periods, in particular trailing 3 month and trailing 6 month correlations. We found negligible difference between the behavior of 3 and 6 month correlations (data available upon request) which display similar paths and range of correlation. We chose the 90 day period because this more closely represents the frequency of market participant rebalancing and the tendency of the market to process downdrafts within a fairly compressed period of time. The data was sourced from publicly available and reliable sites on Bloomberg, Yahoo Finance, and EAB Investment Group. There can be no guarantee, as with all simulations, and studies that these results will exactly mirror those experienced in these strategies going forward. The simulations are based on indices and, as such; do not include fees and expenses investors might experience in actual funds. We utilize trailing 3 month rolling correlations because we believe this smooths out very short term changes but are reflective of the real experience investors face throughout the life of their portfolios. The analysis on the various hypothetical fixed income performance scenarios are based on financially accepted modeling techniques and are for illustration only and not meant to represent actual returns or a forecast of actual fixed income returns.

For questions about the study please contact the following authors:

Arnim Holzer
aholzer@eabinvestmentgroup.com
(917) 593-3303

William Visconto
bvisconto@eabinvestmentgroup.com
(646) 583- 0032

About EAB Investment Group:

EAB Investment Group is a SEC registered investment adviser dedicated to providing best-in-class risk management and strategy solutions for clients. The firm helps portfolio managers navigate through tough market environments and develop investment profiles that are more attractive to target investors. EAB develops equity and index option strategies using proprietary valuation methods. Strategies created are consistent with the portfolio manager's objective. EAB treats each client as a partner and works closely to understand the investment thesis of the strategy.

This information has been prepared solely for informational purposes for institutional investors only. This information is for the use of the intended recipients only; it may not be reproduced or disseminated, in whole or in part, without the written consent of EAB Investment Group LLC ("EAB Investment Group").

Past results are not indicative of future performance. Changes in economic conditions will affect the returns of investments in different ways. Any investment involves a risk of a loss. All information herein is from sources believed to be reliable but have not been independently verified. No representation or warranty can be given with respect to the accuracy or completeness of the information, and is subject to updating, revision, and amendment. EAB disclaims any and all liability relating to this information, including without limitation any express or implied representations or warranties for statements contained in, and omissions from, this information. Subscribers to any service provided by EAB Investment Group should consult their own financial advisors, legal counsel, and accountants as to financial, tax, legal, and related matters concerning their subscription to EAB Investment Group's service. No part of this presentation constitutes financial, tax, or legal advice. EAB Investment Group reserves the right to modify its current investment strategies and techniques based on changing market dynamics or client needs. The information provided in this report should not be considered a recommendation to purchase or sell any particular security. The securities or sectors discussed herein are for informational purposes only and do not represent client portfolios managed by EAB Investment Group; it should not be assumed that any of the securities or sectors discussed herein were or will be included in such portfolios.

The S&P 500 Index consists of 500 stocks chosen for market size, liquidity, and industry group representation. It is a market-value weighted index (stock price times number of share outstanding), with each stock's weight in the Index proportionate to its market value. The S&P 500 is one of the most widely used benchmarks of US equity performance.

The MSCI ACWI represents the Modern Index Strategy and captures all sources of equity returns in 23 developed and 24 emerging markets.

Options involve risk and are not suitable for all investors. Prior to buying or selling an option, a person must receive a copy of Characteristics and Risks of Standardized Options. The information in this document is provided solely for general education and information purposes and do not represent a particular portfolio managed by EAB Investment Group. No statement contained herein should be construed as a recommendation to buy or sell a security or futures contract or to provide investment advice. Supporting documentation for any claims, comparisons, statistics or other technical data in this document is available from EAB Investment Group, LLC upon request. EAB is a registered investment adviser. Registration does not imply a certain level of skills or training. More information about the firm, including its investment strategies and objectives, can be found in EAB's Investment Group's ADV Part 2, which is available, without charge, upon request. EAB-17-538.